PRIORITY

OUT60555

T O P S E C R E T 030151Z CITE [redacted] 9219 1966 DEC 3 02 31Z

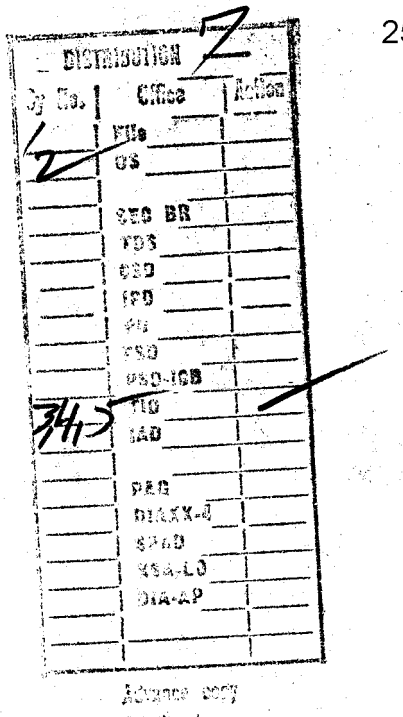
25X1

25X1

SUBJ: MISSION 1037 PHOTOGRAPHIC EVALUATION INTERIM REPORT (PEIR)

5 DEC 1966

25X1



Declassification Review by NGA/DoD

1. NUMERICAL SUMMARY

MSN NO AND DATES:	1037-1, 8-12 NOVEMBER 1966
	1037-2, 13-20 NOVEMBER 1966
LAUNCH DATE AND TIME:	8 NOVEMBER 1966/1957Z
VEHICLE NO:	1632
CAMERA SYSTEM:	J-38 (PG-2)
PAN CAMERA NOS:	FORWARD-LOOKING (MASTER) 198
	AFT-LOOKING (SLAVE) 199
MSN 1037-1 S/I NO:	D-101/128/124
MSN 1037-2 S/I NO:	D-106/136/134
RECOVERY REVS:	MSN 1037-1 D66
	MSN 1037-2 D195

2. CAMERA SETTINGS

FORWARD LOOKING:	0.225 INCH SLIT WRATTEN 23A FILTER
AFT LOOKING:	0.175 INCH SLIT WRATTEN 21 FILTER

3. PERFORMANCE SUMMARY

A. THE IMAGE QUALITY OF MISSION 1037-1 AND 1037-2 IS CONSISTENTLY GOOD AND COMPARABLE TO MISSION 1035. A PRIMARY REASON

GROUP 1
Excluded from automatic downgrading and declassification

25X1

TOP SECRET

FOR THE HIGH QUALITY OF THE MISSION IS CONSIDERED TO BE UNUSUALLY GOOD ATMOSPHERIC CONDITIONS. ANALYSIS OF CLOUD COVER FROM INDEX CAMERA PHOTOGRAPHY SHOWS AN EXCEPTIONALLY HIGH PERCENTAGE OF CLOUD FREE AREAS (SEE PARA 6 - COMMENTS).

B. VISUAL COMPARISON OF ORIGINAL NEGATIVE AND DUPLICATE POSITIVE FILMS FROM BOTH SEGMENTS OF THE MISSION INDICATES THAT THE AFT CAMERA IMAGERY CONTAINS SLIGHTLY GREATER DETAIL THAN THAT OF THE FORWARD CAMERA. THIS RELATIONSHIP IS CONSISTENT WITH RESULTS FROM MOST PREVIOUS MISSIONS.

C. NO CORN TARGETS WERE RECORDED ON THIS MISSION.

D. MISSION 1037 IS THE SECOND "J" SYSTEM FLOWN WITH THE PHOTOGRAMMETRIC CONFIGURATION. DETAILS OF PG PERFORMANCE ARE DISCUSSED IN PARAGRAPH 5.

4. ANOMALIES

ANOMALIES INCLUDING THOSE REPORTED IN THE "31" MESSAGES (REFS. A AND B) WERE REVIEWED.

A. BOTH PAN CAMERA FILMS HAD HIGHER THAN NORMAL BASE PLUS FOG DENSITIES THROUGHOUT THE MISSIONS WITH DENSITIES DURING MISSION 1037-2 SLIGHTLY HIGHER THAN THOSE IN 1037-1. THE TOTAL BASE PLUS FOG VALUES AT THE FULL LEVEL OF DEVELOPMENT RANGED FROM 0.34 TO 0.38, WHILE HEAD AND TAIL SENSITOMETRIC CONTROL STRIPS SHOWED BASE PLUS FOG DENSITIES OF 0.18 TO 0.20.

CAUSE: ABOUT HALF (0.1 DENSITY) OF THE DISCREPANCY CAN BE DIRECTLY ATTRIBUTED TO AN INHERENT DIFFERENCE BETWEEN THE BATCH OF TYPE 3404 FILM USED FOR PROCESS MACHINE CONTROL

AND THE ACTUAL FLIGHT MATERIAL. THIS DIFFERENCE WAS MEASURED BY PROCESSING SENSITOMETRIC EXPOSURES PREPARED ON SAMPLES OF FLIGHT MATERIAL REMOVED BEFORE LAUNCH ALONG WITH CONTROL STRIPS. THERE IS NO APPARENT EXPLANATION FOR THE REMAINING Ø.Ø8 TO Ø.1Ø FOG DENSITY.

ACTION: REVIEW BASE PLUS FOG DENSITIES OF FLIGHT MATERIAL FROM PREVIOUS MISSIONS TO DETERMINE NEED FOR FURTHER ACTION. [redacted] 25X1

B. RAIL SCRATCHES FROM BOTH PAN CAMERAS WERE SUBSTANTIALLY LESS THAN USUAL ON PAST SYSTEMS. THE SLAVE CAMERA FORMATS HAD SLIGHTLY RAGGED EDGES DUE TO SCRAPED EMULSION NEAR THE TAKE-UP END ON THE BINARY RAIL.

CAUSE: THIS SYSTEM WAS FLOWN WITH POLISHED RAILS. THE REDUCED SCRATCHING IS ATTRIBUTED LARGELY TO THIS FEATURE.

ACTION: THIS ITEM IS INCLUDED TO NOTE THE EFFECTS OF POLISHED PAN CAMERA RAILS. NO ADDITIONAL ACTION IS INDICATED.

C. LOW DENSITY FOG STREAKS ARE LOCATED JUST INSIDE THE RAIL EDGES OF FORMATS FROM BOTH PAN CAMERAS. THESE STREAKS ARE MINOR AND BARELY DETECTABLE IN MOST CASES.

CAUSE: THE FOG STREAKS ARE CAUSED BY RAIL HOLE LIGHTS REFLECTED OFF THE RAILS. [redacted] HAS ALREADY MODIFIED THE SIZE OF RAIL HOLE LAMP APERTURES IN PG EXPOSURE SLITS TO REDUCE THIS FOGGING. 25X1

ACTION: MONITOR TEST RESULTS IN FUTURE SYSTEMS TO VERIFY CORRECTIVE ACTION. [redacted] 25X1

D. LOW DENSITY LIGHT LEAK AFFECTS SMALL AREAS OF BOTH PAN CAMERA FILMS AT TIMES OF LONG NON-OPERATE PERIODS.

CAUSE: THERE APPEARS TO BE TWO SOURCES OF LIGHT LEAKAGE, EACH AFFECTING BOTH PAN CAMERA FILMS. WHILE EXACT LOCATION OF THE SOURCES HAS NOT BEEN ESTABLISHED, ONE IS THE VICINITY OF THE SLAVE CAMERA OUTPUT H.O., AND THE OTHER IN THE VICINITY OF THE MASTER CAMERA DRUM.

ACTION: SINCE THE FOG PATTERNS (1) DID NOT OCCUR IN TEST (2) ARE NOT FROM USUAL PROBLEM LOCATIONS, AND (3) ARE OF VERY MINOR SIGNIFICANCE, THE PET DOES NOT CONSIDER THE ANOMALY TO WARRANT FURTHER INVESTIGATION.

E. DOUBLE EXPOSURES OCCURRED ON STELLAR AND INDEX FRAMES 253 OF MISSION 1037-1, AND FRAMES 1 AND 397 OF MISSION 1037-2.

CAUSE: THE DOUBLE EXPOSURES OF FRAMES 1 (1037-2) IS A NORMAL CONDITION OF PHASING THE S/I SEQUENCE OF OPERATIONS FROM LAUNCH CONDITION. THE DOUBLE EXPOSURES OF FRAMES 253 (1037-1) AND 397 (1037-2) APPEAR TO HAVE BEEN CAUSED BY THE SWITCH OF S/I PROGRAMMER CONTROL FROM FORWARD TO AFT CAMERA. IN BOTH CASES, THE FIRST COMMAND THAT THE AFT CAMERA GAVE WAS A PLATEN COMMAND. THE CONDITION HAS NOT BEEN COMPLETELY ESTABLISHED BUT IT APPEARS TO BE INHERENT IN THE DESIGN.

ACTION: INVESTIGATE TRADE-OFF OF REDESIGN VS SIGNIFICANCE OF THE PROBLEM. [redacted] 25X1

F. CRESCENT SHAPED AREAS OF GROUND IMAGERY ARE VISIBLE THROUGH THE CORRELATION LAMP HOLES OF BOTH INDEX CAMERAS AT TIMES WHEN THE CORRELATION LAMP IS OFF. THE CONDITION DOES

NOT AFFECT USE OF CORRELATION LAMP IMAGES.

CAUSE: IMAGED LIGHT BEYOND THE FORMAT AREA ENTERS A SPACE BETWEEN THE RESEAU PLATE AND THE CORRELATION LIGHT TUBE. THE CONDITION IS NOT CONSIDERED A FUNCTIONAL HAZARD.

ACTION: NONE INDICATED.

G. GROUPS OF PLUS AND MINUS DENSITY STREAKS AND ASSOCIATED INDENTATIONS OCCUR ACROSS THE WIDTH OF THE AFT CAMERA FILM OF MISSION 1037-2. THE STREAKS AND INDENTATIONS WHICH ARE AT VARIOUS ANGLES TO THE FILM EDGE, APPEARED ON PASSED D84, D166, D167 AND D168.

CAUSE: UNKNOWN.

ACTION: NONE INDICATED.

H. CHARACTERISTIC ANOMALIES: THERE ARE CERTAIN CHARACTERISTIC ANOMALIES WHICH ARE CONSIDERED INHERENT TO THE OPERATION OF THE CORONA SYSTEM. WHILE THESE ITEMS WARRANT ATTENTION TO PREVENT FURTHER DEGRADATION IT IS NOT FELT THAT SPECIFIC ACTION ITEMS SHOULD BE ASSIGNED. A SUMMARY OF THESE ITEMS AND THE DEGREE OF DEGRADATION IS PRESENTED BELOW.

(1) RAIL SCRATCHES - SEE PARA 4B ABOVE.

(2) DENDRITIC STATIC DISCHARGE ALONG THE EDGE OF BOTH PAN CAMERA FILMS IS CONSIDERED NORMAL.

(3) SCRATCHES WITHIN THE FORMATS OF BOTH PAN CAMERAS CAUSED BY THE SCAN HEAD ROLLERS ARE LESS THAN NORMAL.

(4) INTERMITTENT FINE SCRATCHES GENERALLY PARALLEL TO THE MAJOR AXIS OF BOTH MAIN FILMS OCCUR TO AN AVERAGE EXTENT.

(5) PLUS DENSITY STATIC MARKING ALONG BOTH STELLAR

FILM MARGINS WAS NORMAL.

(6) THE PLUS DENSITY STREAKS REFERRED TO AS "JETTISONED FUEL PARTICLES" PERSISTED LONGER IN 1037-1 THAN NORMAL. THERE WAS ONLY ONE OBSERVED ON THE 1037-2 STELLAR FILM.

5. PHOTOGRAMMETRIC DATA RECORDING (PG)

A. THE ANALYSIS OF THE DATA PRESENTATION PECULIAR TO THE PG PORTION OF 1037-1 AND 1037-2 WAS MADE FROM O.N. MATERIAL AND WAS COMPARED DIRECTLY WITH INSTRUMENT SAMPLINGS PRODUCED DURING A/P TESTING AT R-4 DAY. THESE COMMENTS ARE NOT INTENDED TO BE AN INDICATION OF THE ULTIMATE USABILITY OF THE PG DATA. IN GENERAL, THE MASTER INSTRUMENT (FWD-LOOKING NO. 198) PRODUCED BETTER QUALITY RAIL HOLE IMAGES ON THE OUTBOARD (200 PPS) RAIL THAN DID THE SLAVE INSTRUMENT. THE MASTER INSTRUMENT IMAGES WERE AT BEST ONLY FAIR, BEING ELONGATED IN THE SCAN DIRECTION. THE INBOARD RAIL IMAGE QUALITY OF THE MASTER INSTRUMENT WAS POOR, EXHIBITING CONSIDERABLE INCONSISTENCY IN IMAGE SIZE, DENSITY, AND GENERAL SHAPE. THE IMAGES ARE GENERALLY INCOMPLETE AND DO NOT EXHIBIT CIRCULARITY, EDGE SHARPNESS OR HIGH DENSITY. THE SLAVE INSTRUMENT (AFT-LOOKING NO. 199) PRODUCED OUTBOARD RAIL HOLE IMAGES THAT VARIED FROM GOOD TO POOR IN ANY ONE FRAME. THE INBOARD RAIL IMAGES WERE GENERALLY SIMILAR TO THE OUTBOARD EXCEPT SOMEWHAT BETTER IN QUALITY, FROM GOOD TO FAIR IN ANY ONE FRAME.

B. BLOCKED RAIL HOLES - THE LOSS OF RAIL HOLE IMAGES

DURING MISSION 1037 CORRELATED IN PART TO THE PASSAGE OF MANUFACTURING SPLICES. THIS CORRELATES WITH MISSION 1035 (REF: 1035 PEIR). COMPARISON TO THE PREVIOUS FRAME IN BOTH CASES INDICATES THAT NO HOLES WERE LOST DURING INPUT METERING. HOWEVER, A COMPARISON TO THE FOLLOWING FRAMES SHOW THAT IN BOTH INSTANCES, ALL THE HOLES ON THE OUTBOARD RAIL BETWEEN THE SPLICE AND THE TAKE-UP END OF THAT RAIL, WHICH WERE PREVIOUSLY CLEAR, BECAME BLOCKED AS THE SPLICES WERE METERED OUT OF THE RAILS.

C. THE NODAL TRACES ON THE ORIGINAL NEGATIVES ARE SIMILAR IN APPEARANCE TO THOSE SEEN IN PRE-FLIGHT TESTING WITH TWO MAJOR EXCEPTIONS:

(1) THE OVERALL DENSITY OF THE TRACES ON BOTH CAMERAS IS GREATER IN THIS MISSION THAN IN 1035-1 AND 1035-2. THIS IS DUE IN PART TO THE FACT THAT THE TRACES EXHIBITED HIGHER DENSITIES DURING PRE-FLIGHT TESTING, AND IN PART TO THE INCREASE IN BASE PLUS FOG WHICH RESULTED IN HIGHER NODAL TRACE DENSITIES.

(2) THE DECREASE IN LINE WIDTH TO 25 MICRONS IS A FUNCTION OF OPERATION UNDER VACUUM CONDITIONS. THERE WAS NO INSTANCE OF UNDULATING OR MISSING NODAL TRACES DETECTED.

6. COMMENTS

A. THE INDEX CAMERA PHOTOGRAPHY ANALYSIS IS AS FOLLOWS:

1037-1, FRAMES WITH LESS THAN 10 PERCENT CLOUD COVERAGE 143 OR 31 PERCENT.

1037-2, FRAMES WITH LESS THAN 10 PERCENT CLOUD COVERAGE 207 OR 44 PERCENT.

B. ALL MAIN CAMERA MATERIAL WAS PROCESSED ON THE TRENTON EQUIPMENT.

C. THE PHOTO INTERPRETERS INDICATED THAT THE NODAL TRACES ON SEVERAL OCCASIONS INTERFERED WITH THE ANALYSIS OF TARGETS. THE TRACES WERE FOUND TO BE DISTURBING DURING THE EVALUATION OF THE FILM WHILE BEING RAPIDLY SCANNED.

T O P S E C R E T

-END OF MESSAGE-